

***FlyBy Math™* Alignment**
Voluntary State Curriculum
Mathematics

Standard 1.0 Knowledge of Algebra, Patterns, and Functions

Students will algebraically represent, model, analyze, or solve mathematical or real-world problems involving patterns or functional relationships.

Topic A. Patterns and Functions

Indicator 1. Identify, describe, extend, and create linear patterns and functions

Objectives	<i>FlyBy Math™</i> Activities
c. Describe how a change in one variable in a linear function affects the other variable in a table of values	<p>--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p> <p>--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.</p>

Topic B. Expressions, Equations, and Inequalities

Indicator 2. Identify, write, solve, and apply equations and inequalities

Objectives	<i>FlyBy Math™</i> Activities
e. Apply given formulas to a problem solving situation	--Use the distance-rate-time formula to predict and analyze aircraft conflicts.

Topic C. Numeric and Graphic Representations of Relationships

Indicator 1. Locate points on a number line and in a coordinate grid

Objectives	<i>FlyBy Math™</i> Activities
b. Graph ordered pairs in a coordinate plane.	--Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes.
c. Graph linear equations with one operation in a coordinate plane.	--Represent distance, speed, and time relationship for constant speed cases using linear equations and a Cartesian coordinate system.

Indicator 2. Analyze linear relationships

Objectives	<i>FlyBy Math™</i> Activities
a. Identify and describe the change represented in a graph	<p>--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.</p> <p>--Interpret the slope of a line in the context of a distance-rate-time problem.</p>

b. Describe the rate of change of a linear relationship by a table of values and a graph	<p>--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system.</p> <p>--Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.</p> <p>--Interpret the slope of a line in the context of a distance-rate-time problem.</p>
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Standard 3.0 Knowledge of Measurement

Students will identify attributes, units, or systems of measurements or apply a variety of techniques, formulas, tools or technology for determining measurements.

Topic C. Applications in Measurement

Indicator 2. Analyze measurement relationships

Objectives	<i>FlyBy Math™</i> Activities
b. Determine the distance between 2 points using a drawing and a scale	<p>--Calculate and measure the position and time of simulated aircraft. Represent that motion using tables, graphs, equations, and experimentation.</p> <p>--Plot points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system to describe the motion of two airplanes.</p>

Standard 4.0 Knowledge of Statistics

Students will collect, organize, display, analyze, or interpret data to make decisions or predictions.

Topic B. Data Analysis

Indicator 1. Analyze data

Objectives	<i>FlyBy Math™</i> Activities
b. Determine the best choice of a data display	--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.

Standard 6.0 Knowledge of Number Relationships and Computation/Arithmetic

Students will describe, represent, or apply numbers or their relationships or will estimate or compute using mental strategies, paper/pencil or technology.

Topic C. Number Computation

Indicator 3. Analyze ratios, proportions, and percents

Objectives	<i>FlyBy Math™</i> Activities
b. Determine and use rates, unit rates, and percents as ratios in the context of a problem	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.

Standard 7.0 Process of Mathematics

Students demonstrate the processes of mathematics by making connections and applying reasoning to solve problems and to communicate their findings.

Topic A. Problem Solving**Indicator 1. Apply a variety of concepts, processes, and skills to solve problems**

Objectives	<i>FlyBy Math™</i> Activities
c. Make a plan to solve a problem	--Use calculations and experimental evidence to predict, describe, and explain several aircraft conflict problems.
d. Apply a strategy, i.e., draw a picture, guess and check, finding a pattern, writing an equation	--Use tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
e. Select a strategy, i.e., draw a picture, guess and check, finding a pattern, writing an equation	--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes.
f. Identify alternative ways to solve a problem	--Choose among tables, bar graphs, line graphs, a Cartesian coordinate system, and equations to model aircraft conflicts and predict outcomes. --Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.
h. Extend the solution of a problem to a new problem situation	--Use graphs to compare airspace scenarios for both the same and different starting conditions and the same and different constant (fixed) rates.

Topic B. Reasoning**Indicator 1. Justify ideas or solutions with mathematical concepts or proofs**

Objectives	<i>FlyBy Math™</i> Activities
a. Use inductive or deductive reasoning	--Predict the relative motion of two airplanes on given paths. --Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.
b. Make or test generalizations	--Predict the relative motion of two airplanes on given paths. --Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.
c. Support or refute mathematical statements or solutions	--Predict outcomes and explain results of mathematical models and experiments.

Topic C. Communications	
Indicator 1. Present mathematical ideas using words, symbols, visual displays, or technology	
Objectives	<i>FlyBy Math™</i> Activities
a. Use multiple representations to express concepts or solutions	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.
b. Express mathematical ideas orally	--Predict outcomes and explain results of mathematical models and experiments.
c. Explain mathematical ideas in written form	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.
d. Express solutions using concrete materials	--Use calculations and experimental evidence to predict, describe, and explain several aircraft conflict problems.
e. Express solutions using pictorial, tabular, graphical, or algebraic methods	--Represent distance, speed, and time relationship for constant speed cases using tables, bar graphs, line graphs, equations, and a Cartesian coordinate system. --Use tables, bar graphs, line graphs, equations, and a Cartesian coordinate system to draw conclusions.
f. Explain solutions in written form	--Explain and justify solutions regarding the motion of two airplanes using the results of plotting points on a schematic of a jet route, on a vertical line graph, and on a Cartesian coordinate system.
Topic D. Connections	
Indicator 1. Relate or apply mathematics within the discipline, to other disciplines, and to life	
Objectives	<i>FlyBy Math™</i> Activities
b. Identify mathematical concepts in relationship to other disciplines	--Apply mathematics to predict and analyze aircraft conflicts and validate through experimentation.
c. Identify mathematical concepts in relationship to life	--Apply mathematics to solving distance, rate, and time problems for aircraft conflict scenarios.